

AUTO-TRACKING AND AUTO-SHOT TECHNOLOGIES ALLOW RAPID MEASUREMENT WITH THE AL-SCAN

Advanced algorithms boost strength of the signal output in dense cataracts.

BY TIM DONALD, CONSULTING EDITOR

Rapid measurement is vital for patient comfort and efficient workflow. The AL-Scan Optical Biometer (Nidek; Figure 1) measures six values for cataract surgery in 10 seconds: axial length, anterior chamber depth, central corneal thickness, white-to-white distance, pupil size, and corneal curvature radius, according to the company.¹ The device incorporates Nidek's 3-D auto-tracking and auto-shot technologies, ensuring ease of operation and comfort for the user. The 3-D auto-tracker follows eye movements in the x, y, and z planes; once correct alignment is achieved, the auto-shot feature automatically captures the image and data.

In cataractous eyes, the advanced algorithms incorporated in this diagnostic device help to filter signal from noise, boosting strength of the signal output in dense cataracts. In extremely dense cataracts that are not conducive to optical biometry, an optional built-in ultrasound biometer is available for the AL-Scan. With this feature, virtually any eye can be measured without having to move the patient or connect to an external ultrasound device.



Figure 1. Measuring six values in 10 seconds, the AL-Scan incorporates 3-D auto-tracking and auto-shot technologies.

The software of the AL-Scan includes nine IOL power calculation formulas, including Regression and Regression II, Binkhorst, Hoffer Q, Holladay, Haigis, Camellin-Calossi, and Shammam PL. Once the measurement capture is completed, IOL power is automatically calculated

using the acquired data. Surgeons can improve accuracy by using the unit's IOL A-constant optimization feature; the AL-Scan statistically calculates optimum A-constants based on postoperative refraction data.

The AL-Scan also provides assistance for toric IOL implantation. On the acquired frontal image of the cornea, iris, and conjunctiva, the device can draw a line passing through a vessel or other landmark to indicate the angle from the steepest corneal meridian.

The line and angle are clearly marked and overlaid onto the eye image, which can be taken to the operating room to act as a guide for toric IOL implantation.

In addition to the frontal image, the AL-Scan supplies other anterior segment views, including cross-sectional lens image, pupil image, and reflected image of corneal mires for astigmatism assessment.

The display is provided on a tiltable 8.4-inch color LCD touchscreen. ■

1. Optical Biometer AL-Scan. Nidek Co. Ltd. website. http://www.nidek-intl.com/product/ophthaloptom/diagnostic/dia_cornea/al-scan.html. Accessed June 15, 2015.



Highlights of the AL-Scan in Clinical Practice

By Sheraz M. Daya, MD, FACP, FACS, FRCS(Ed), FRCOphth



What is your overall impression of the AL-Scan?

For the past 2 years, we have used the AL-Scan at one of our practices and the OPD-Scan III (both by Nidek)

at all three locations. The AL-Scan is quick and easy to use, with little training needed. What makes the device so easy to use is the 3-D auto-tracking and auto-shot features, which essentially take over once an eye is sensed, enabling alignment and focusing along the x, y, and z axes. Once the eye is aligned, image and data acquisition are performed automatically.

How do you use the AL-Scan in clinical practice?

Image data include pupil positioning (for those who feel this is important for multifocal IOL positioning) and a Scheimpflug cross-section that can demonstrate cataract density. Eight built-in formulas aid in lens calculation, and IOL constants can be optimized by entering post-operative refractive data. The AL-Scan accurately determines the steepest axis and can produce an image with the steepest meridian over an image of the eye, so that the relationship to a vessel or landmark can be determined. This visual guide can then be used in the operating room.

What are the advantages of the AL-Scan compared with other ocular biometry technologies?

Data from the AL-Scan can be integrated with data from the OPD-Scan III through a peripheral desktop program called the IOL Station. This is a clever innovation, as it is peripheral software that does not require the doctor to physically go to and interrogate the instrument, potentially disturbing technicians and their workflow. Additionally, changes in software can be achieved with a

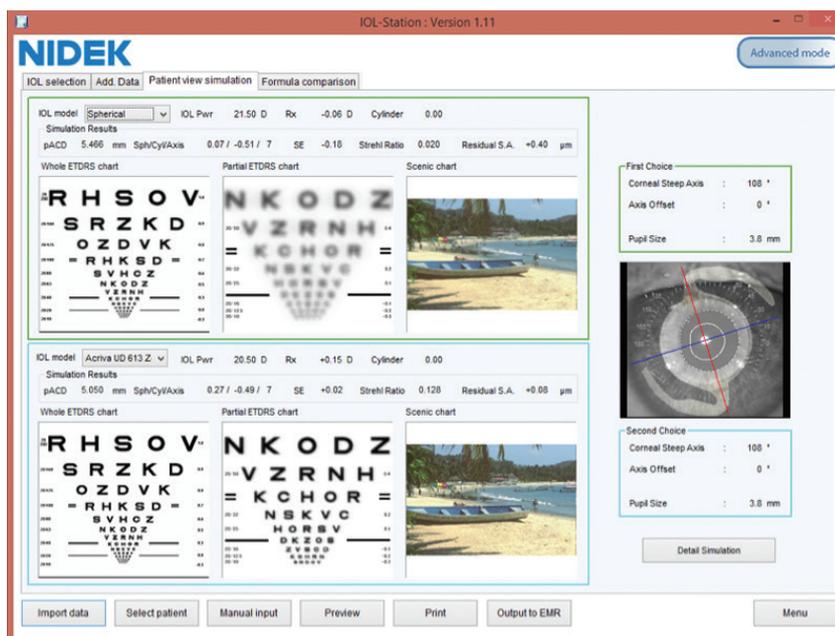


Figure 1. The IOL Station predicts visual performance on a variety of IOLs, assisting the surgeon in using the best lens optic to match the patient's cornea.

simple upgrade to the desktop without any need for an engineer to make an office visit to change software on the device.

The IOL Station software predicts visual performance for a variety of IOLs, assisting the surgeon in choosing the best lens optic to match the patient's cornea (Figure 1). I must confess I do not use this feature much, as more than 90% of my patients undergo surgery with trifocal IOL implants; however, for those patients with abnormal corneas, and for the surgeon not well versed in corneal topography, the IOL Station software is a valuable tool.

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(Courtesy of Sheraz M. Daya, MD, FACP, FRCS(Ed), FRCOphth)